

**NONPROVISIONAL APPLICATION FOR LETTERS PATENT
UNITED STATES OF AMERICA**

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Be it known that I, **RICHARD URASH**, residing at **492
Logan Store Road, Americus, Georgia 31719**, a citizen of the
10 United States, have invented certain new and useful
improvements in an

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EXHAUST PIPE COVER

of which the following is a specification.

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INVENTOR'S REPRESENTATIVES:

**BARRY E. KAPLAN, ESQ.
ASHISH D. PATEL, ESQ.**

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**MYERS & KAPLAN
INTELLECTUAL PROPERTY LAW, L.L.C.
1827 Powers Ferry Road
Building 3, Suite 200
Atlanta, GA 30339
Telephone: (770) 541-7444
Facsimile: (770) 541-7448
Email: bkaplan@mkiplaw.com
Email: apatel@mkiplaw.com**

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EXHAUST PIPE COVER

TECHNICAL FIELD

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The present invention relates generally to exhaust pipe covers, and more specifically to an exhaust pipe cover configured and adapted to cap or overlay an exhaust pipe port, wherein ejection of exhaust through the exhaust pipe port results in the vertical elevation or displacement and full clearance of the cover from the exhaust pipe port. In view of conventional disc or plate-like exhaust pipe covers pivotally-fixed to the exhaust pipe port, the present exhaust pipe cover is particularly advantageous for its ability to resist forceful wind-induced, pivotal uplift, and thus prevents the entry of rain, snow, dirt, dust, and/or other foreign particulate or matter, into the exhaust pipe and the communicating engine

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BACKGROUND OF THE INVENTION

In general, exhaust pipes function to expel waste gases produced in the combustion chamber of an engine. Many large gasoline, diesel, and/or gasoline-oil mix

engines often comprise a vertically-disposed exhaust pipe to facilitate ejection of such waste gases. Additionally, because machinery (i.e., tractors, trucks, irrigation motors, generators, or the like) incorporating such engines
5 with vertically-disposed exhaust pipes are typically utilized in the open environment, the port of the vertical exhaust pipe is often covered via a pivotally-fixed or hinged lid, flap or other plate-like cover, so as to prevent the entry of rain, snow, dirt, dust, and/or other
10 foreign particulate or matter, into the exhaust pipe and the communicating engine. However, such pivotally-fixed plate-like covers possess inherent disadvantages that render use of same highly inefficient, impractical and problematic.

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Specifically, many pivotally-fixed plate-like covers possess a diameter greater than the diameter of the exhaust pipe port and, as such, often extend a particular distance past the peripheral edge thereof when seated flush
20 thereagainst. Such a selected structural arrangement and dimensional difference in diameter is utilized to preclude recession or entry of the plate-like cover into the exhaust pipe port, and subsequent lodging of same therewithin.

However, the portion of the plate-like cover extending past the peripheral edge of the exhaust pipe port is also subject to being "caught" by forceful gusts of wind that result in the forceful, pivotal uplift of the plate-like
5 cover. Unfortunately, in the presence of inclement weather, such wind-induced pivotal uplift of the plate-like cover may result in the entry of rain, snow, dirt, dust, and/or other foreign matter, into the exhaust pipe and communicating engine, thereby resulting in potential damage
10 to the internal components thereof.

Although plate-like covers having a peripheral edge flush with the peripheral edge of the exhaust pipe port are available, such structural arrangements are not immune from
15 wind-induced pivotal uplift and accompanying entry of foreign matter into the exhaust port.

Additionally, plate-like covers having counterweights also present disadvantages. Specifically, because such
20 assemblies provide a nearly balanced cover, light winds often possess sufficient force to lift the cap. As such, in the presence of corrosion in the pivot joint or hinges, and combined with the nearly balanced construction of such

counterweighted-cover assemblies, the cover, once lifted via wind forces, will remain in an open or flipped back position, thereby permitting the introduction of rain and other foreign matter into the exhaust pipe.

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However, even in the absence of forceful winds, plate-like covers in general do not completely preclude the entry or seepage of rainwater therepast and into the exhaust pipe, and therefore, inadequately shield the internal,
10 communicating engine components from associated water damage.

Therefore, it is readily apparent that there is a need for an exhaust pipe cover adapted to resist wind-induce
15 uplift, and entry of any accompanying rain, snow, dirt, dust, and/or other foreign matter, into the exhaust pipe and communicating engine, wherein such a device may be retrofitted to existing vertically-disposed exhaust pipes extending from engines incorporated into machinery such as,
20 for exemplary purposes only, tractors, trucks, irrigation motors, generators, and the like. There is also a need for an exhaust pipe cover that effectively precludes the entry

or seepage of any rainwater therepast and into the exhaust pipe and communicating engine components.

BRIEF SUMMARY OF THE INVENTION

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Briefly described, in a preferred embodiment, the present invention overcomes the above-mentioned disadvantages and meets the recognized need for such a device by providing an exhaust pipe having an extended
10 peripheral lip to facilitate coverage of an exhaust pipe port, wherein the cover is adapted to be vertically elevated and fully "cleared" or displaced therefrom via the ejection of exhaust through the exhaust pipe port, and wherein cessation of forceful exhaust pressures results in
15 the return of the cover over the exhaust pipe port. The cover is preferably retained and guided during vertical displacement within a vertically disposed guide plate having a track formed therethrough. Movement of the cover within the track is facilitated via a system of bearings
20 incorporated with the cover.

According to its major aspects and broadly stated, the present invention in its preferred form is an exhaust pipe

cover having, in general, a cover, guide plate and guide track.

More specifically, the present invention is an exhaust
5 pipe cover having a cap or cover comprising an extended
peripheral lip possessing a pair of brackets or arms
adjoined therewith and extending therefrom. A series of
bolts with overlying bearings extend through the arms and
assist in retaining the arms, and attached cover, in
10 slidable engagement with a guide track formed through a
vertically-disposed guide plate removably fastened to the
port of the exhaust pipe. As such, in the presence of
forceful exhaust emissions from the exhaust pipe port, the
cover is forced upward and vertically guided through the
15 track of the guide plate and, once fully cleared from the
exhaust pipe port, tilts back into an upright position
(i.e., into a substantially ninety-degree angle relative to
the resting position of the cover and/or the cover's
vertical displacement and ascent through the guide track
20 just before tilting into an upright position). Cessation
of exhaust pressures through the exhaust pipe results in
downward pivotal movement of the cover and subsequent

downward vertical descent of the cover into its resting position over the exhaust pipe port.

Accordingly, a feature and advantage of the present invention is its ability to resist wind-induce uplift and entry of any accompanying rain, snow, dirt, dust, and/or other foreign matter, into the exhaust pipe and communicating engine.

Another feature and advantage of the present invention is its ability to effectively preclude the entry or seepage of any rainwater therepast and into the exhaust pipe and communicating engine components.

Still another feature and advantage of the present invention is its ability to provide an extended peripheral lip to facilitate coverage of an exhaust pipe port.

Yet another feature and advantage of the present invention is its ability to provide a guide track system to permit vertical displacement and full clearance of a cover from an exhaust pipe port.

Yet still another feature and advantage of the present invention is its incorporation of a bearing system to permit slidable engagement and vertical displacement of a cover within a vertically-disposed guide track.

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A further feature and advantage of the present invention is its ability to shield the interior of an exhaust pipe and communicating engine components from entry of harmful foreign matter.

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Still a further feature and advantage of the present invention is its ability to be retrofitted to existing vertically-disposed exhaust pipes extending from engines incorporated into machinery such as, for exemplary purposes only, tractors, trucks, irrigation motors, generators, and the like.

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These and other features and advantages of the present invention will become more apparent to one skilled in the art from the following description and claims when read in light of the accompanying drawings.

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BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood by reading the Detailed Description of the Preferred and Alternate Embodiments with reference to the accompanying drawing figures, in which like reference numerals denote similar structure and refer to like elements throughout, and in which:

10 **FIG. 1** is an exploded view of an exhaust pipe cover according to a preferred embodiment of the present invention;

15 **FIG. 2** is a perspective view of an exhaust pipe cover according to a preferred embodiment of the present invention, showing the cover in a resting position;

20 **FIG. 3A** is a side view of an exhaust pipe cover according to a preferred embodiment of the present invention, showing the cover in a resting position;

FIG. 3B is a side view of an exhaust pipe cover according to a preferred embodiment of the present

invention, showing the cover vertically displaced and moving through an ascending position;

FIG. 4A is a side view of an exhaust pipe cover according to a preferred embodiment of the present invention, showing the cover moving through an ascending position toward a fully displaced and upright position; and,

FIG. 4B is a side view of an exhaust pipe cover according to a preferred embodiment of the present invention, showing the cover in a fully displaced and upright position.

DETAILED DESCRIPTION OF THE PREFERRED
AND ALTERNATIVE EMBODIMENTS

In describing the preferred and alternate embodiments of the present invention, as illustrated in **FIGS. 1-4B**, specific terminology is employed for the sake of clarity. The invention, however, is not intended to be limited to the specific terminology so selected, and it is to be understood that each specific element includes all

technical equivalents that operate in a similar manner to accomplish similar functions.

Referring now to **FIG. 1**, the present invention in a preferred embodiment is an exhaust pipe cover **10** comprising cover portion **20**, guide plate **80** and guide track **100**, wherein guide track **100** is preferably formed through guide plate **80**, as more fully described below. Preferably, cover portion **20** and guide plate **80** are manufactured from a suitable metal, such as, for exemplary purposes only, aluminized steel, stainless steel, zinc plated heavy-gauge steel, galvanized steel, and/or any other material (metallic or non-metallic) capable of withstanding extreme temperatures, corrosion, rust, and the like.

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Cover portion **20** is preferably substantially cylindrical-shaped, comprising upper member **22** and peripheral wall **24** extending downwardly therefrom. Upper member **22** and peripheral wall **24** preferably define recess **26**, wherein recess **26** preferably comprises a sufficient diameter dimensioned to receive a conventional exhaust pipe port therein, and thus facilitate engagement of cover portion **20** thereover. It should be recognized that cover

portion 20, and exhaust pipe cover 10 in general, could be manufactured and/or modified to facilitate application of same to any size or diameter exhaust pipe port, without departing from the appreciative scope of the present invention, as such modifications are in full contemplation of the inventor in describing the present invention herein.

Preferably affixed to, and extending from, peripheral wall 24 of cover portion 20 are brackets 28 and 30. Brackets 28 and 30 are preferably disposed approximately parallel to one another, and are positioned a sufficient distance apart to facilitate receipt of vertical guide plate 80 therein for slidable engagement therewith, as more fully described below. Preferably formed through bracket 28 are aligned upper throughholes 32 and 34, and lower throughhole 36, preferably disposed below and aligned with upper throughhole 34. Similarly, preferably formed through bracket 30 are aligned upper throughholes 38 and 40, and lower throughhole 42, preferably disposed below and aligned with upper throughhole 42. Throughholes 32, 34 and 36 of bracket 28 are preferably aligned with throughholes 38, 40 and 42, respectively, of bracket 30 to facilitate receipt

therethrough of respective bolts **50**, **52** and **54**, for purposes more fully described below.

Preferably, guide plate **80** comprises upper arcuate
5 edge **82**, opposing edges **84** and **86**, and bottom edge **88**.
Extending from edge **84**, and disposed proximate to bottom
edge **88**, is approximately Y-shaped bracket **90**, preferably
comprising plate-like first portion **92** and arcuate second
portion **94** disposed substantially perpendicular thereto.
10 Bracket **92** preferably functions to provide guide plate **80**
with lateral support against conventional exhaust pipe port
P, wherein arcuate second portion **94** of bracket **90**
preferably possesses a sufficient arc to facilitate
substantially flush seating of same against the exterior of
15 generally cylindrical-shaped exhaust pipe port **P**. It
should be recognized that the general arc of arcuate second
portion **94** could be manufactured and/or modified to
facilitate substantially flush seating of arcuate second
portion **94** to any size or diameter of cylindrical-shaped
20 exhaust pipe port **P**, without departing from the
appreciative scope of the present invention, as such
modifications are in full contemplation of the inventor in
describing the present invention herein. It is further

contemplated that second portion **94** could be substantially flat or plate-like to facilitate substantially flush seating of same against a substantially flat-surface section of a selected exhaust pipe port. It is
5 contemplated in yet another alternate embodiment that second portion **94** could be substantially cylindrical or tubular-shaped and suitably dimensioned to facilitate a frictional or interference-fit over exhaust pipe port **P**.

10 Preferably formed at the interface of first portion **92** and arcuate second portion **94** of bracket **90** are apertures or slots **92a** and **92b**. Slots **92a** and **92b** are preferably dimensioned to receive hose gear or worm gear clamps **96** and **98** therethrough for securing guide plate **80** to exhaust pipe
15 port **P** in a substantially upward or vertical configuration, as more fully described below. Although clamps **96** and **98** are preferably utilized to secure guide plate **80** to exhaust pipe port **P**, it is contemplated in alternate embodiment that other suitable fastening mechanisms could be utilized,
20 such as, for exemplary purposes only, ties, clasps, rivets, bolts, screws, spot welding, integral formation, or the like.

Preferably formed through guide plate **80** is guide track **100**, wherein guide track **100** preferably assists in maintaining cover portion **20** in slidable engagement with guide plate **80**, and thus functions to guide cover portion **20** through a specific vertical displacement during emission, and subsequent cessation, of waste gases through exhaust pipe port **P**. Specifically, guide track **100** preferably comprises first linear track **102** formed proximal edge **86** of guide plate **80**, second arcuate track **106** formed proximal edge **84** and upper arcuate edge **82**, and connecting track **104** extending between and in communication with first linear track **102** and second arcuate track **106**. The dimensions, configuration, and strategically-selected relative positions of tracks **102**, **104** and **106** within guide plate **80** will become more apparent to one skilled within the art in view of the following description detailing the interaction of cover portion **20**, brackets **28** and **30**, and bolts **50**, **52** and **54** with guide track **100**.

More specifically, upon fully engaging guide plate **80** within brackets **28** and **30** of cover portion **20**, respective throughholes **34**, **36**, **40** and **42** preferably align within first linear track **102**, and respective throughholes **32** and

38 preferably align within second arcuate track 106. Thereafter, a two-piece bearing assembly 60 is preferably concentrically positioned between each throughhole 32, 34 and 36 of bracket 28 and respectively aligned throughholes 5 38, 40 and 42 of bracket 30. Bearing assemblies 100 are preferably retained between brackets 28 and 30 via insertion of bolts 50, 52 and 54 through throughholes 32, 34 and 36, respectively, through respective bearing assemblies 60, and through respectively aligned 10 throughholes 38, 40 and 42, wherein bolts 50, 52 and 54 are subsequently secured therewithin via nuts 50a, 52a and 54b, respectively. In such a configuration, retaining brackets 28 and 30, and attached cover portion 20, are maintained in slidable engagement with guide track 100, as more fully 15 described below.

Preferably, each bearing assembly 60 is structurally and functionally equivalent, comprising inner bearing portion 62 and outer bearing portion 64 seated thereover. 20 Inner bearing portion 62 is preferably slightly longer than outer bearing portion 64, so as to permit inner bearing portion to be securely retained or clamped between brackets 28 and 30 via a selected bolt 50, 52 and 54, as more fully

described below. Outer bearing portion **64** is preferably dimensioned to be seated over inner bearing portion **62** and rotate freely thereover, wherein suitable lubricants may be utilized therebetween to facilitate rotational interaction of same and reduce surface friction therebetween. Preferably, outer bearing portion **64** of each bearing assembly **60** comprises a circumference sufficient to permit slidable interaction of outer bearing portion **64** within tracks **102**, **104** and **106** of guide track **100**, wherein suitable lubricants may be utilized therebetween to facilitate rotational interaction of same and reduce surface friction therebetween. Although a two-piece bearing system **60** is preferred, it should be recognized that any suitable bearing system could be utilized to facilitate slidable interaction of cover portion **20** with guide track **100**, such as, for exemplary purposes only, single-pieced bearings, needle bearings, ball bearings, sleeve bearings, sintered metal bearings, simple clearance and lubrication arrangements, or the like. It is further contemplated that the external surface of each outer bearing portion **64** could possess a groove, channel, or could comprises a concave bearing, to facilitate slidable interlocking with the edges of each track **102**, **104** and **106**.

As best illustrated in **FIGS. 2-4B**, to secure guide plate **80** to exhaust pipe port **P** in a substantially upward or vertical configuration, clamps **96** and **98** are preferably passed through respective slots **92a** and **92b** of first portion **92**, and appropriately fastened around exhaust pipe port **P**. Preferably, guide plate **80** is appropriately positioned and fastened around exhaust pipe port **P** so that cover portion **20** is fully seated over and rests on exhaust pipe port **P**. In such a "resting" configuration, bolt **54** and corresponding bearing assembly **60** preferably rest in lower terminal region **102a** of first linear track **102**, wherein bolt **50** and corresponding bearing assembly **60** preferably rest in lower terminal region **106a** of second arcuate track **106**.

As such, and with specific reference to **FIGS. 3A-4B**, in the presence of forceful exhaust emissions from exhaust pipe port **P**, cover portion **20** is forced upward and vertically guided through guide track **100**. Specifically, bolts **50**, **52** and **54** and corresponding bearing assemblies **60** preferably assist in slidably guiding cover portion **20** though guide track **100** in the presence of forceful exhaust emissions. Contact of bolt **52** and corresponding bearing

assembly **60** with upper terminal end **102b** of first linear track **102** interrupts vertical displacement of cover portion **20**, and results in bolt **54** and corresponding bearing assembly **60** aligning with and slidably passing through first end **104a** of connecting track **104**; thereby, permitting upward pivotal movement of cover portion **20**. Contemporaneous with the slidable passage of bolt **54** through connecting track **104**, bolt **50** and corresponding bearing assembly **60** slidably move upward and through second arcuate track **106**. As bolt **54** passes through second end **104b** of connecting track **104** and into second arcuate track **106**, bolt **50** proceeds through the arcuate path of second arcuate track **106**, wherein contact of bolt **50** with upper terminal region **106b** of second arcuate track **106** forces cover portion **20** into a substantially upright position (i.e., into an approximately ninety-degree angle relative to the resting position of cover portion **20** and/or cover portion's **20** vertical displacement and ascent through guide track **100** just before tilting into an upright position). Cessation of exhaust pressures through exhaust pipe port **P** results in downward pivotal movement of cover portion **20** and subsequent downward vertical descent of cover portion **20** into its resting position over exhaust pipe port **P**.

Although cover portion **20** is brought into a substantially upright position, it should be recognized that cover portion **20** could be brought into any pivotal angle, or, alternately, permitted to only move in vertical
5 displacement and not in a pivotal or tilting movement.

It should further be recognized that guide track **100** of exhaust pipe cover **10** could be selectively modified to reflect other designs, arrangements and/or configurations
10 to facilitate or manipulate vertical and/or pivotal movement of cover portion **20** slidably engaged therewith. It is contemplated that such modifications could be implemented when it is desirable to equip unconventional exhaust pipes with the present invention.

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It is contemplated in another alternate embodiment that recess **26** of cover portion **20** could incorporate any suitable seal to facilitate air-tight and/or water-tight engagement with exhaust pipe port **P**, wherein such seals may
20 include, without limitation, heat-resistant rubber seals, elastomeric seals, fiber seals, asbestos seals, ribbed seals, or the like. Such seals could be suitably placed in recess **26** and selectively fastened or secured therein via

suitable heat-resistant adhesives, epoxies or resins, and/or via riveting, other suitable mechanical fasteners, integral formation, or the like. Such seals could also be placed on the peripheral edge of exhaust pipe port **P**.

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It is still further contemplated that guide plate **80** could comprise a ring-like flange portion formed thereon, and extending therefrom, for surroundingly engaging exhaust pipe port **P** in the lateral plane relative to the centerline
10 of exhaust pipe port **P**. The flange portion could comprise a seal affixed thereon and therearound to permit cover portion **20** to rest thereagainst, and accordingly seal-off exhaust pipe port **P**. Such seals may include, without limitation, heat-resistant rubber seals, elastomeric seals,
15 fiber seals, asbestos seals, ribbed seals, or the like.

Having thus described exemplary embodiments of the present invention, it should be noted by those skilled in the art that the within disclosures are exemplary only, and
20 that various other alternatives, adaptations, and modifications may be made within the scope of the present invention. Accordingly, the present invention is not

limited to the specific embodiments illustrated herein, but is limited only by the following claims.